

Claims

- [c1] In an ultrasound machine for generating an image responsive to moving structure of a subject, apparatus representing displacement of the moving structure comprising:
- a front-end arranged to transmit ultrasound waves into the structure and to generate received signals in response to ultrasound waves backscattered from the structure over a time period;
 - a display arranged to display the image of the moving structure in response to the received signals;
 - a user interface enabling a user of the machine to overlay the image on the display with a first pattern of indicia corresponding to sampled anatomical locations within the moving structure; and
 - a processor responsive to the received signals to generate parameter signals representing displacement of the anatomical locations corresponding to the pattern of indicia during at least a portion of the time period and responsive to the parameter signals to generate a second pattern of indicia corresponding to the displacement of the anatomical locations and to overlay the second pattern of indicia on the image on the display.
- [c2] The apparatus of claim 1 wherein the moving structure comprises cardiac tissue.
- [c3] The apparatus of claim 1 wherein the displacement represents one of distance moved by the moving structure and deformation of the moving structure .
- [c4] The apparatus of claim 1 wherein the image is displayed with a predetermined geometry and the first pattern of indicia comprises a set of lines in the predetermined geometry.
- [c5] The apparatus of claim 4 wherein the set of lines comprises dashed lines.
- [c6] The apparatus of claim 4 wherein the lines are equidistant apart.
- [c7] The apparatus of claim 1 wherein the processor generates the parameter signals by summing a set of signal values representing mean velocities of the moving

structure over at least of portion of the time period.

[c8] The apparatus of claim 1 wherein the time period comprises at least a portion of a cardiac cycle selectable by a user of the machine including at least one of systole, diastole, IVC, IVR, E-wave, and A-wave.

[c9] The apparatus of claim 8 wherein the portion of the cardiac cycle is selectable from at least one of a set of signal values and a timing event signal comprising at least one of an ECG signal, a phonocardiogram signal, a pressure wave signal, a pulse wave signal, and a respiratory signal.

[c10] The apparatus of claim 1 wherein the image is one of a B-mode image, a combined B-mode/TVI image, a combined B-mode/SRI image, a TVI image, and an SRI image.

[c11] In an ultrasound machine for generating an image responsive to moving structure of a subject, a method of representing displacement of the moving structure comprising:

- transmitting ultrasound waves into the structure;
- generating received signals in response to ultrasound waves backscattered from the structure over a time period;
- displaying the image of the moving structure in response to the received signals;
- enabling a user of the machine to overlay the image on the display with a first pattern of indicia corresponding to sampled anatomical locations within the moving structure;
- generating parameter signals representing displacement of the anatomical locations corresponding to the pattern of indicia during at least a portion of the time period in response to the received signals; and
- generating a second pattern of indicia corresponding to the displacement of the anatomical locations in response to the parameter signals and displaying the second pattern of indicia overlaid on the image.

[c12] The method of claim 11 wherein the moving structure comprises cardiac tissue.

[c13] The method of claim 11 wherein the displacement represents the distance

moved by the moving structure and deformation of the moving structure.

- [c14] The method of claim 11 wherein the image is displayed with a predetermined geometry and the first pattern of indicia comprises a set of lines in the predetermined geometry.
- [c15] The method of claim 14 wherein the set of lines comprises dashed lines.
- [c16] The method of claim 14 wherein the lines are equidistant apart.
- [c17] The method of claim 11 wherein said generating the parameter signals comprises summing a set of signal values representing mean velocities of the moving structure over at least a portion of the time period.
- [c18] The method of claim 11 wherein the time period comprises at least a portion of a cardiac cycle selectable by a user of the machine.
- [c19] The method of claim 18 wherein the portion of the cardiac cycle is selectable from at least one of a set of signal values and a timing event signal comprising at least one of an ECG signal, a phonocardiogram signal, a pressure wave signal, a pulse wave signal, and a respiratory signal.
- [c20] The method of claim 11 wherein the image is one of a B-mode image, a combined B-mode/TVI image, a combined B-mode/SRI image, a TVI image, and an SRI image.